

IN THE CLAIMS:

1 1. (Currently Amended) A semiconductor laser device comprising:
2 a plurality of laser light oscillators that each emit a laser beam from an outlet
3 thereof; [[and]]
4 a diffraction grating that transmits a laser beam that is oscillated in at least one of
5 the laser light oscillators and is emitted from an outlet thereof, so that a portion of the laser beam
6 is incident on at least one of the other laser light oscillators, and
7 one or more condenser lenses; wherein
8 the one or more condenser lenses receives the laser beam emitted from an outlet
9 portion of the diffraction grating and the diffracting grating is positioned optically between the
10 plurality of laser light oscillators and the one or more condenser lenses.

1 2. (Previously Presented) The semiconductor laser device according to Claim 1,
2 wherein the plurality of laser light oscillators are included in a semiconductor
3 laser array element, and
4 the diffraction grating is disposed so as to face the outlet of the at least one of the
5 laser light oscillators, the diffraction grating being a translucent member that (a) partially
6 transmits the laser beam and (b) partially reflects or scatters the laser beam so that a portion of
7 the laser beam is directed to the at least one of the other laser light oscillators.

1 3. (Previously Presented) The semiconductor laser device according to Claim 1,
2 wherein the plurality of laser light oscillators are included in a plurality of
3 semiconductor laser array elements in such a manner that at least two laser light oscillators are

4 included in each laser light oscillator in an array, the plurality of semiconductor laser array
5 elements being stacked up, and

6 the diffraction grating is disposed so as to face the outlet of the at least one of the
7 laser light oscillators included in one of the semiconductor laser array elements, the diffraction
8 grating being a translucent member that (a) partially transmits the laser beam and (b) partially
9 reflects or scatters the laser beam so that a portion of the laser beam is directed to the at least one
10 of the other laser light oscillators included in the other semiconductor laser array elements.

1 4. (Previously Presented) The semiconductor laser device according to Claim 1,
2 wherein a reflecting optical path, a scattering optical path, and a transmitting
3 optical path of the diffraction grating are directed to the outlet of the at least one of the other
4 laser light oscillators, thereby the portion of the laser beam is directed in a vicinity of an optical
5 axis of the laser beam at the outlet of the at least one of the other laser light oscillators.

1 5. (Previously Presented) The semiconductor laser device according to Claim 2,
2 wherein the diffraction grating is a flat plate having a main surface that is either a
3 flat plane or a scabrous plane, the main surface being an incidence plane of the laser beam, and
4 the diffraction grating partially reflects or scatters the laser beam on the main surface.

1 6. (Previously Presented) The semiconductor laser device according to Claim 3,
2 wherein the diffraction grating is a flat plate having a main surface that is either a
3 flat plane or a scabrous plane, the main surface being an incidence plane of the laser beam, and
4 the diffraction grating partially reflects or scatters the laser beam on the main surface.

1 7. (Previously Presented) The semiconductor laser device according to Claim 2,
2 wherein the diffraction grating is a flat plate which includes the diffraction grating
3 on a main surface thereof, the main surface being an incidence plane of the laser beam, and the
4 flat plate partially diffracts the laser beam on the diffraction grating at a predetermined angle
5 when the diffraction grating partially reflects the laser beam.

1 8. (Previously Presented) The semiconductor laser device according to Claim 3,
2 wherein the diffraction grating is a flat plate which includes a diffraction grating
3 on a main surface thereof, the main surface being an incidence plane of the laser beam, and the
4 flat plate partially diffracts the laser beam on the diffraction grating at a predetermined angle
5 when the diffraction grating partially reflects the laser beam.

1 9. (Previously Presented) The semiconductor laser device according to Claim 7,
2 wherein the diffraction grating directs -1st order diffracted light and +1st order
3 diffracted light generated when the laser beam is partially diffracted, so as to be respectively
4 incident on laser light oscillators that are adjacent to the at least one of the laser light oscillators
5 from which the laser beam has been emitted.

1 10. (Previously Presented) The semiconductor laser device according to Claim 8,
2 wherein the diffraction grating directs -1st order diffracted light and +1st order
3 diffracted light generated when the laser beam is partially diffracted, so as to be respectively
4 incident on laser light oscillators that are adjacent to the at least one of the laser light oscillators
5 from which the laser beam has been emitted.

1 11. (Previously Presented) The semiconductor laser device according to Claim 2,
2 wherein the diffraction grating has been subjected to hologram processing so as to
3 function as a hologram to condense or collimate a portion of the laser beam that has transmitted
4 therethrough.

1 12. (Previously Presented) The semiconductor laser device according to Claim 3,
2 wherein the diffraction grating has been subjected to hologram processing so as to
3 function as a hologram to condense or collimate a portion of the laser beam that has transmitted
4 therethrough.

1 13. (Previously Presented) The semiconductor laser device according to Claim 2,
2 wherein the plurality of laser light oscillators each have two outlets, from one of
3 which the laser beam is emitted to be reflected, scattered, or diffracted by the optical element,
4 and from the other of which the laser beam is emitted from the semiconductor laser array
5 element,
6 the diffraction grating is disposed so as to face the one outlet of each of the laser
7 light oscillators, and reflects, scatters, or diffracts the laser beam.

1 14. (Previously Presented) The semiconductor laser device according to Claim 3,
2 wherein the plurality of laser light oscillators each have two outlets, from one of
3 which the laser beam is emitted to be reflected, scattered, or diffracted by the diffraction grating,
4 and from the other of which the laser beam is emitted from the semiconductor laser array
5 element,

6 the diffraction grating is disposed so as to face the one outlet of each of the laser
7 light oscillators, and reflects, scatters, or diffracts the laser beam.

1 15. (Original) The semiconductor laser device according to Claim 3,
2 wherein the plurality of semiconductor laser array elements respectively include
3 substrate layers that have been cut out of one semiconductor wafer.

1 16. (Previously Presented) The semiconductor laser device according to Claim 2,
2 wherein the plurality of oscillators are in a single array and each has a real
3 refractive index guided self-aligned structure.

1 17. (Original) The semiconductor laser device according to Claim 3
2 wherein the plurality of semiconductor laser array elements each have a real
3 refractive index guided self-aligned structure.

1 18. (Original) A multiple wavelength laser light emitting apparatus, comprising:
2 a plurality of semiconductor laser devices that each emits a plurality of laser
3 beams, wavelengths of the laser beams emitted from each semiconductor laser device being
4 different from wavelengths of the laser beams emitted from a different semiconductor laser
5 device; and

6 an optical element that condenses a plurality of laser beams emitted from each of
7 the plurality of semiconductor laser devices at a predetermined position,

8 wherein at least one of the semiconductor laser devices is the semiconductor laser
9 device described in Claim 1.

1 19. (Original) The multiple wavelength laser light emitting apparatus according to
2 Claim 18, further comprising:

3 an adjusting means for adjusting a position at which the plurality of laser beams
4 emitted from each of the plurality of semiconductor laser devices are condensed, by driving the
5 optical element;

6 a laser driving means for selecting a semiconductor laser device that emits laser
7 beams each having a designated wavelength, out of the plurality of semiconductor laser devices,
8 and driving the selected semiconductor laser device; and

9 a control means for controlling the adjusting means in accordance with a
10 wavelength of the laser beams to be emitted.

1 20-28. (Cancelled)

1 29. (Currently Amended) A semiconductor laser device comprising;

2 a plurality of laser light oscillators that each emit a laser beam from a respective
3 outlet; [[and]]

4 a diffraction grating that at least partially directs a sufficient portion of a laser
5 beam from the plurality of laser light oscillators to enter another of the plurality of laser light
6 oscillators to enable a phase locking of the respective laser light oscillators while transmitting the
7 remaining portion of the laser beam, when the respective outlets of the laser light oscillators are
8 aligned with the diffraction grating to enable each one of the laser light oscillators to receive at
9 least a portion of the laser beam from another of the plurality of laser light oscillators to enable a
10 phase locking of each one of the plurality of laser light oscillators, and

11 one or more condenser lenses; wherein

12 the one or more condenser lenses receives the laser beam emitted from an outlet
13 portion of the diffraction grating and the diffracting grating is positioned optically between the
14 plurality of laser light oscillators and the one or more condenser lenses.

1 30. (Cancelled)

1 31. (Currently Amended) The semiconductor laser device according to Claim 29
2 wherein the ~~optical element~~ diffraction grating is a flat plate.

1 32. (Currently Amended) The semiconductor laser device according to Claim 29
2 wherein the ~~optical element~~ diffraction grating includes a hologram to collimate portions of the
3 laser beams transmitted therethrough.

1 33. (Previously Presented) The semiconductor laser device according to Claim 29
2 wherein the laser light oscillators each have a refractive index guided self-aligned structure and
3 are arranged parallel to each other.

1 34. (Previously Presented) The semiconductor laser device according to Claim 33
2 wherein each of the laser light oscillators include GaInP/AlGaInP quantum well active layers.

1 35. (Currently Amended) The semiconductor laser device according to Claim 29
2 wherein the ~~optical element~~ diffraction grating directs between 10% to 30% of the incident laser
3 beam to enter other laser light oscillators.

1 36. (Currently Amended) The semiconductor laser device according to Claim 29
2 wherein the ~~optical element~~ diffraction grating directs the sufficient portion of the laser beam at
3 an optical axis of another laser light oscillator.

1 37. (Currently Amended) The semiconductor laser device according to Claim 29
2 wherein the ~~optical element~~ diffraction grating is a diffraction grating with vertical and
3 horizontal grooves that cross each other.

1 38. (Currently Amended) The semiconductor laser device of Claim 29 wherein the
2 plurality of laser light oscillators are arranged in a plurality of arrays, each array includes a plural
3 number of laser light oscillators, the arrays are vertically stacked and the ~~optical element~~
4 diffraction grating partially directs a sufficient portion of a plurality of laser beams from each
5 array to enter laser light oscillators of other stacked arrays to enable a phase locking of all of the
6 laser light oscillators.

1 39. (Currently Amended) A semiconductor laser device comprising;
2 a plurality of laser light oscillators that each emit a laser beam from a respective
3 outlet; [[and]]
4 means for phase locking the respective plurality of laser light oscillators including
5 an optical element that at least partially directs a sufficient portion of a laser beam from the
6 plurality of laser light oscillators to enter another of the plurality of laser light oscillators to
7 enable a phase locking of the respective laser light oscillators, when the respective outlets of the
8 laser light oscillators are aligned with the optical element to enable each one of the laser light
9 oscillators to receive at least a portion of the laser beam from another of the plurality of laser
10 light oscillators to enable a phase locking of each one of the plurality of laser light oscillators,
11 and
12 one or more condenser lenses, wherein the one or more condenser lenses receives
13 the laser beam emitted from the means for phase locking and the means for phase locking is

14 positioned optically between the plurality of laser light oscillators and the one or more condenser
15 lenses.

1 40. (Currently Amended) A semiconductor laser device comprising;
2 a plurality of laser light oscillators that each emit a laser beam from a respective
3 outlet; [[and]]
4 an optical element transmits, through the optical element, a major portion of a
5 laser beam from the plurality of laser light oscillators and at least partially directs, apart from the
6 transmission of the major portion, a sufficient portion of a laser beam from the plurality of laser
7 light oscillators to enter another of the plurality of laser light oscillators to enable a phase locking
8 of the respective laser light oscillators, when the respective outlets of the laser light oscillators
9 are aligned with the optical element to enable each one of the laser light oscillators to receive at
10 least a portion of the laser beam from another of the plurality of laser light oscillators to enable a
11 phase locking of each one of the plurality of laser light oscillators, and
12 one or more condenser lenses, wherein the one or more condenser lenses receives
13 the laser beam emitted from the optical element and the optical element is positioned optically
14 between the plurality of laser light oscillators and the one or more condenser lenses.